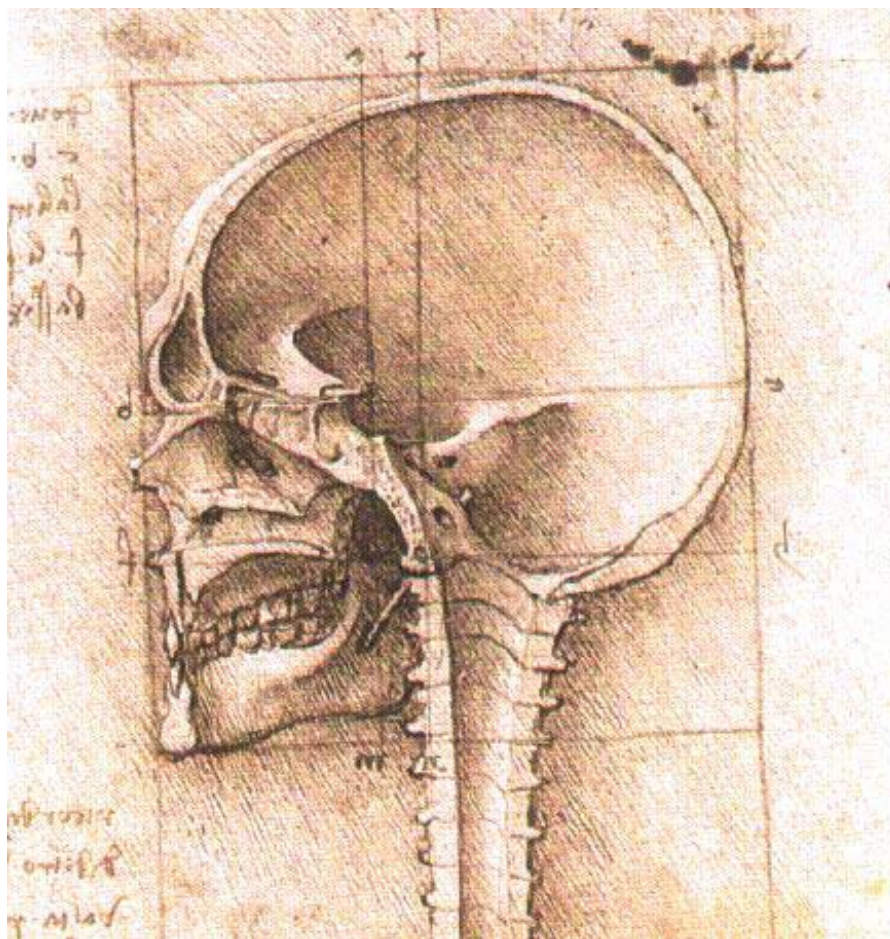


# Traumatic Brain and Spinal Cord Injury in Louisiana

1996-1999 Cumulative Report

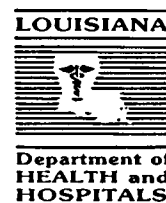


**Injury Research & Prevention Section**



STATE OF LOUISIANA  
DEPARTMENT OF HEALTH AND HOSPITALS

OFFICE OF PUBLIC HEALTH  
David W. Hood, Secretary  
Madeline W. McAndrew, Assistant Secretary



# Acknowledgements

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**The Injury Research and Prevention Section gratefully acknowledges the contributions of the hospital reporters representing the institutions that participate in the Traumatic Brain and Spinal Cord Injury Registry.**

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For more information please contact the Injury Research and Prevention Section, Louisiana Office of Public Health, 325 Loyola Ave., Suite 305, New Orleans, LA 70112; (504) 568-2509; FAX: (504) 568-7312. IRP provides information, educational materials, and technical assistance to organizations, agencies, and individuals interested in injury research and prevention.

Cover: Part of *Skull Study* by Leonardo da Vinci

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## Note: Data Comparability

When the TBI/SCI Registry began in 1988, cases were sent to us using a paper form filled out by reporters, primarily in emergency rooms, around the state. Examination of these data, however, suggested that only about one third of cases were being reported, leading us to substantially underestimate the rate of TBI and SCI in Louisiana. In 1996 we began collecting data in a very different way. Beginning with data from 1996 we adopted the standard case definition for traumatic brain and spinal cord injury established by the Centers for Disease Control and Prevention.<sup>4</sup> This standard case definition is used by other states to estimate national rates of TBI. We asked each hospital to send us a list of all patients admitted with any of a group of ICD-9-CM diagnosis codes suggestive of TBI or SCI. This new data collection method remains in use.

***Because of this methodological change, 1996, 1997, 1998 and 1999 data should not be compared with data from previous years' reports.***

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# Introduction

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Injury is an important public health issue in the United States today. Injury is the leading cause of death and disability among children and young adults and is responsible for the deaths of approximately 150,000 people each year.<sup>1</sup> Injury is among the top eight causes of death for all age categories and comes in as the fifth overall cause of death across all ages.<sup>2</sup> Injuries also claim more years of potential life lost before the age of 65 (YPLL-65) than any other cause (over three and a half million years).<sup>3</sup> Unintentional injury claimed more than two million years in 1994. In comparison, the next most common cause of YPLL-65 is cancer, which claimed under two million years.

Injuries are preventable. Scientific methods can be used to prevent injury. By describing the problem using surveillance techniques, identifying factors that put people at risk for injury, and designing, implementing, and evaluating interventions targeting those risk factors, the burden of injury can be decreased.<sup>1</sup>

Injuries to the brain and spinal cord are most likely to result in death or permanent disability and are a serious health problem in the United States.<sup>4</sup> An estimated 1.5 million people sustain a traumatic brain or spinal cord injury each year in the United States.<sup>2</sup> These injuries are a major public health problem in part because of the permanence of the resulting disability, the high cost of hospitalization and rehabilitative treatment, as well as the fact that they occur more frequently to young people.

Traumatic brain injuries have a deep impact on communities throughout the United States. We need a coordinated response from the public health community to prevent injuries and reduce disabilities.<sup>5</sup> In addition, these non-fatal traumatic brain and spinal cord injuries represent a major economic burden to society. The estimated annual cost of traumatic brain injuries in the United States is over \$224 billion.<sup>1</sup>

The Louisiana legislature mandated the reporting of spinal cord injuries (SCI) beginning in 1985, followed by traumatic brain injuries (TBI) in 1990. This report summarizes the results of Louisiana residents sustaining a traumatic brain or spinal cord injury from 1996 to 1999. This data includes persons who were discharged from a Louisiana hospital or died and had a diagnosis code indicative of a traumatic brain or spinal cord injury. Louisiana residents injured and hospitalized in another state are not included in this surveillance system.

# Traumatic Brain Injury

---

## Summary

Multi-state surveillance data estimates the national annual incidence rate of traumatic brain injury (TBI) at 95 per 100,000 U.S. residents.<sup>6</sup>

From January 1, 1996 to December 31, 1999, 16,203 Louisiana residents sustained a traumatic brain injury. This resulted in an overall TBI incidence rate of 90.0 per 100,000 Louisiana residents. Males were 2.2 times more likely to experience a TBI than females. Consistent with the national figures, we see the highest rates among persons aged 15 to 24 and among the elderly (Figure 2).

Motor vehicle crashes were the leading cause of traumatic brain injury, followed by falls and violence-related injuries (Figure 6). The highest incidence rates, for all causes of injury, were falls among those 65 years and older. The incidence rate for motor vehicle crash-related TBI were highest among persons aged 15 to 24 years (Figure 7).

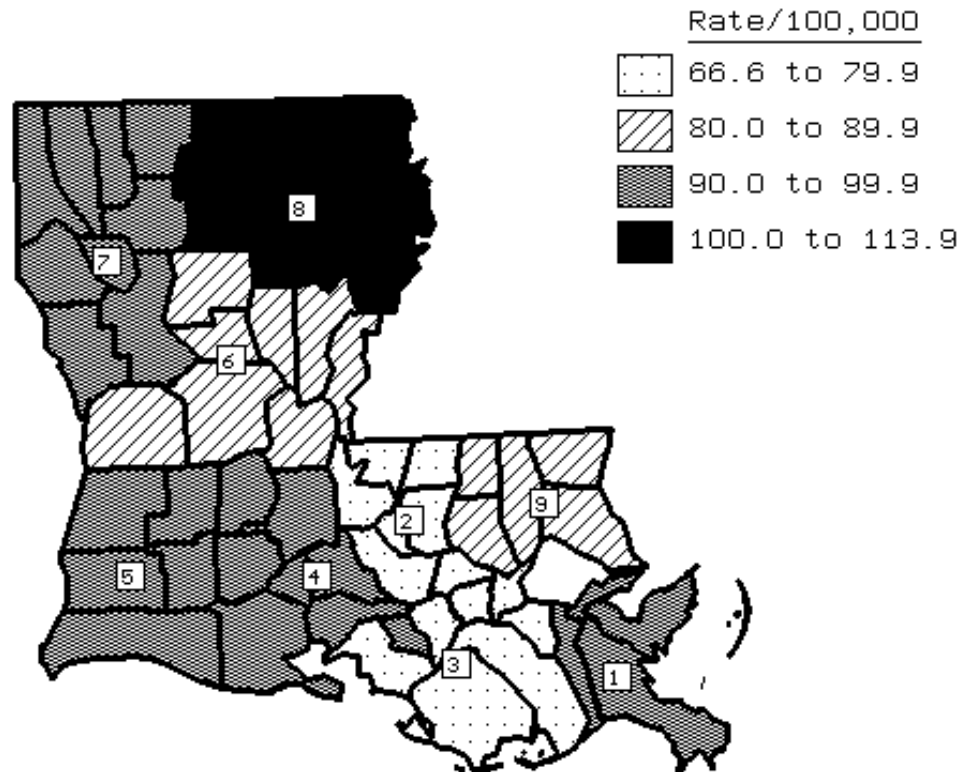
In almost two-thirds of motor vehicle crash-related TBI the injured person was the occupant of a car or truck (Figure 13). One-half of fall-related TBI were the result of a fall on the same level (Figure 15). Over one-third of violence-related TBI involved the use of a cutting, piercing, or blunt instrument (Figure 16).

Over half of all persons sustaining a traumatic brain injury in Louisiana between 1996 and 1999 were discharged to home, but nearly one-third died as a result of the injuries sustained (Figure 10).

The following charts and commentary on pages 3-18 provide a more in-depth report on TBI in Louisiana during 1996-1999.

Figure 1

**Mean Annual TBI Incidence Rates by Region of Residence, LA 1996-1999**  
(N=16,203)

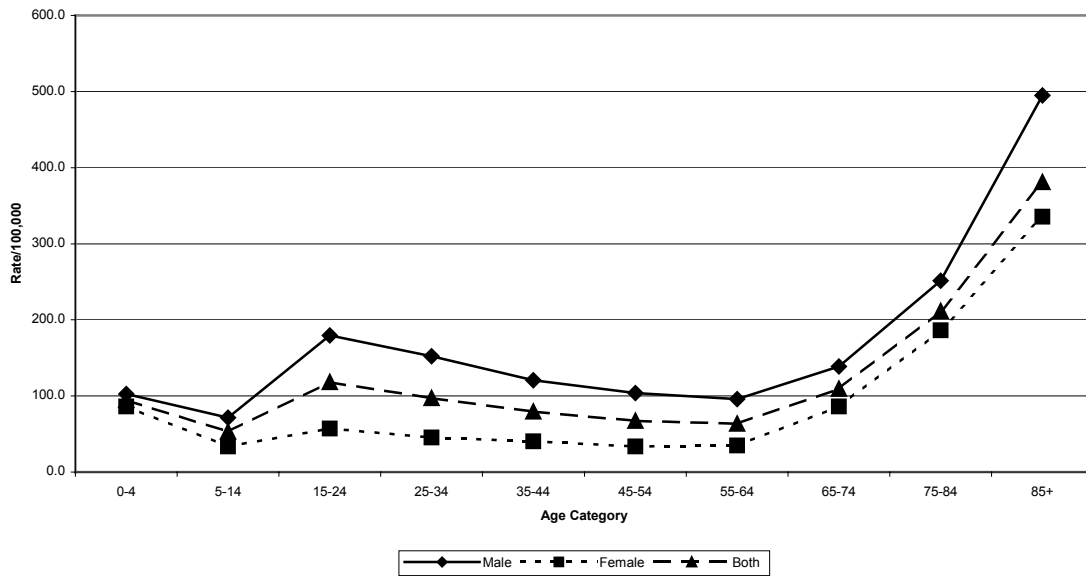


The average annual TBI incidence rate for Louisiana between 1996 and 1999 was 90.0 per 100,000 residents. The highest incidence rate of TBI was 113.9 per 100,000 in Region 8 (Caldwell, East Carroll, Franklin, Jackson, Lincoln, Madison, Morehouse, Ouachita, Richland, Tensas, Union, and West Carroll Parishes). The lowest incidence rate of TBI was 66.6 per 100,000 in Region 3 (Assumption, Lafourche, St. Charles, St. James, St. John, St. Mary, and Terrebonne Parishes).



Figure 2

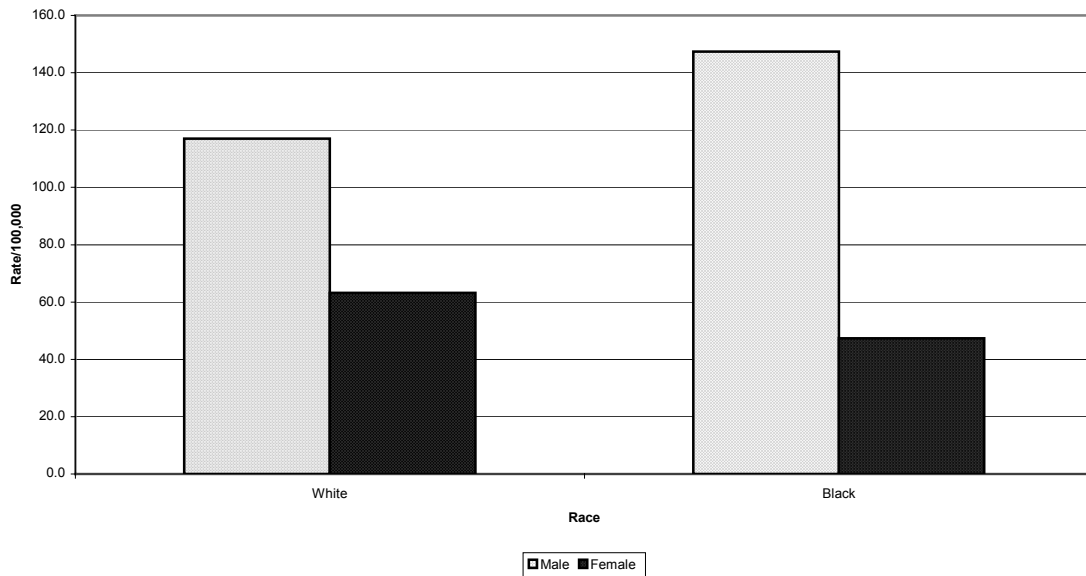
**Mean Annual Incidence Rate of TBI by Age Category, LA 1996-1999  
(N=16,200)**



This figure shows the average incidence rates of traumatic brain injury by age category and gender. Consistent with national estimates, rates peak among persons 15-24 years of age and among the elderly. Rates for males were consistently higher in all age groups.

Figure 3

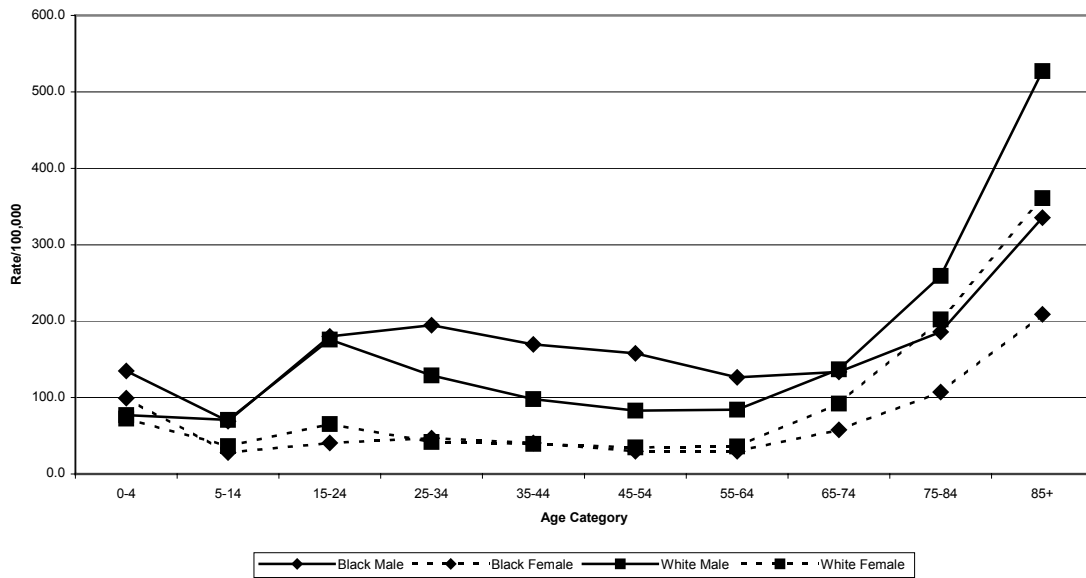
**Mean Annual TBI Incidence Rates by Race and Gender, LA 1996-1999  
(N=15,589)**



Males consistently have higher incidence rates. The rate for black males was higher (147.4 per 100,000 Louisiana residents) than the rate for white males (117.0 per 100,000). White females had a higher rate of TBI (63.2 per 100,000) than the rate for black females (47.3 per 100,000).

Figure 4

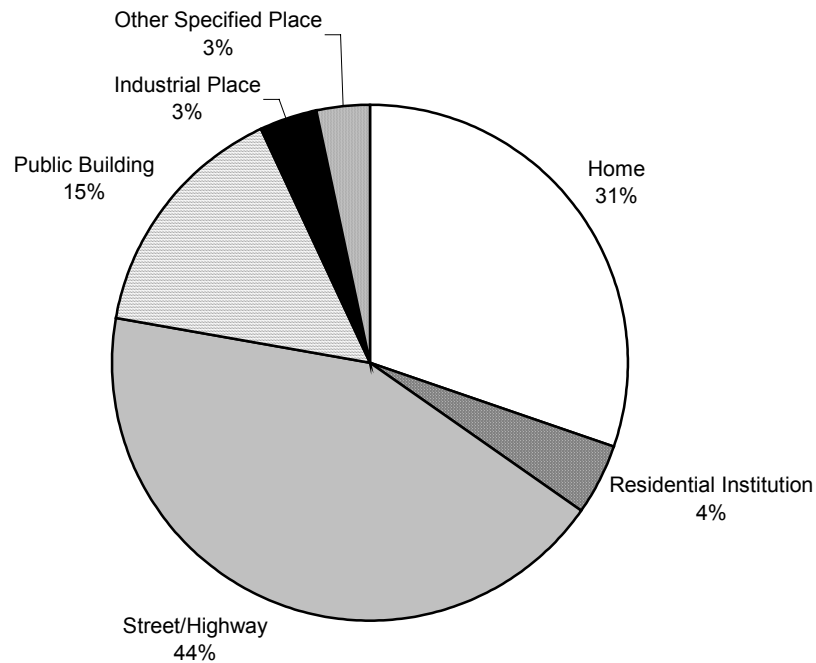
**TBI Incidence Rates by Age Category, Race, and Gender, LA 1996-1999  
(N=15,586)**



This figure shows TBI incidence rates by age category as well as race and gender. All four race and gender groups show a similar pattern of rates by age, though rates for females are generally lower than the rates for males.

Figure 5

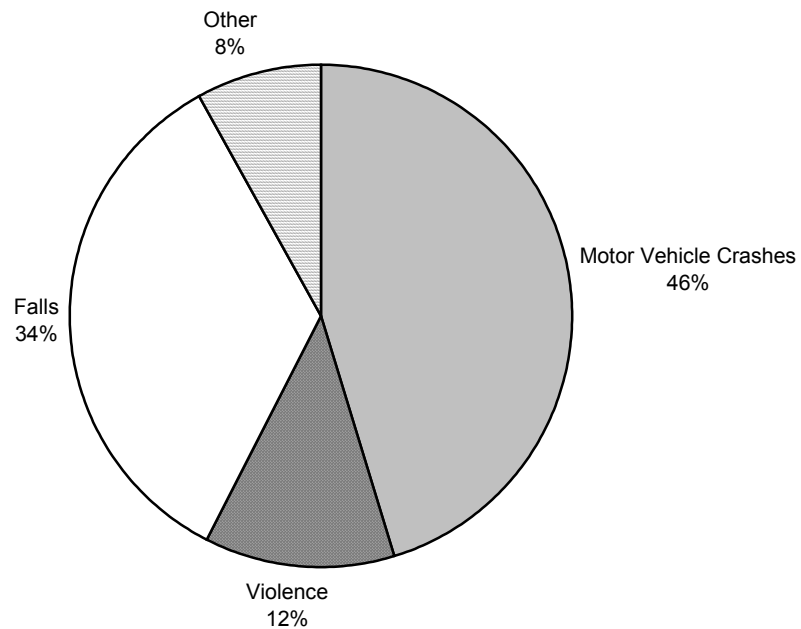
**Place of Occurrence of Traumatic Brain Injuries, LA 1996-1999  
(N=6,567)**



For those in which place of injury is known, 44% of all TBI occurred on a public street or highway. An additional 35% occurred in a home or residential facility (i.e. nursing home), and 15% occurred in a public building (e.g. restaurants, night clubs, hotels, or churches). Another 3% of traumatic brain injuries occurred in industrial locations.

Figure 6

**External Cause of Traumatic Brain Injury, LA 1996-1999**  
(N=3,580)

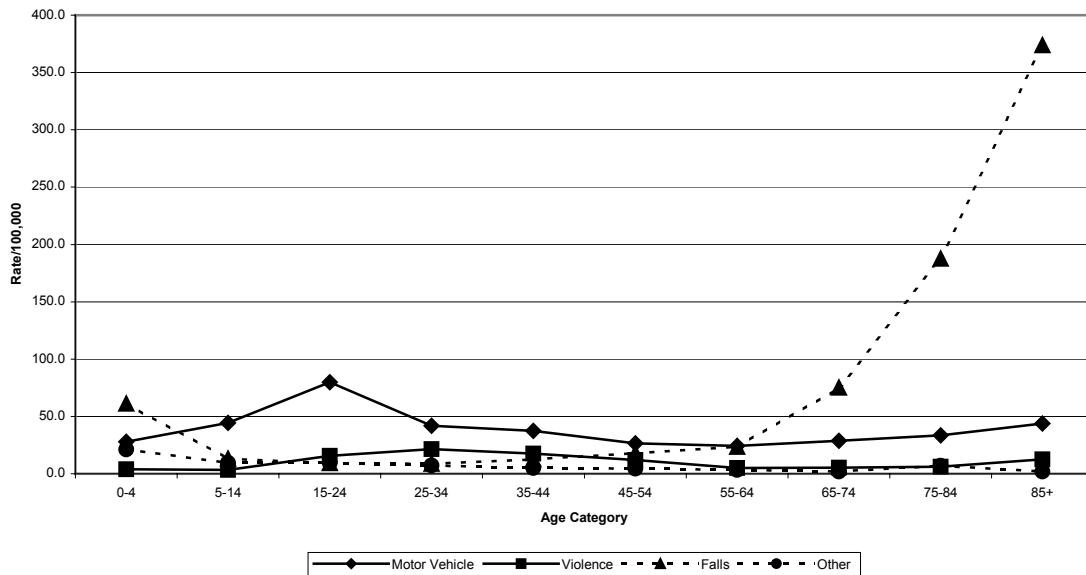


For those in which the external cause of injury was known, motor vehicle crashes (which includes bicycle and pedestrian-related crashes) were the leading cause of traumatic brain injuries between 1996 and 1999, accounting for almost one half of injuries. An additional one-third of TBI from 1996 to 1999 were the result of a fall.

*Related Figures, pages 15-18*

Figure 7

**Estimated TBI Incidence Rates by Age and Cause of Injury, LA 1996-1999  
(N=16,203)**

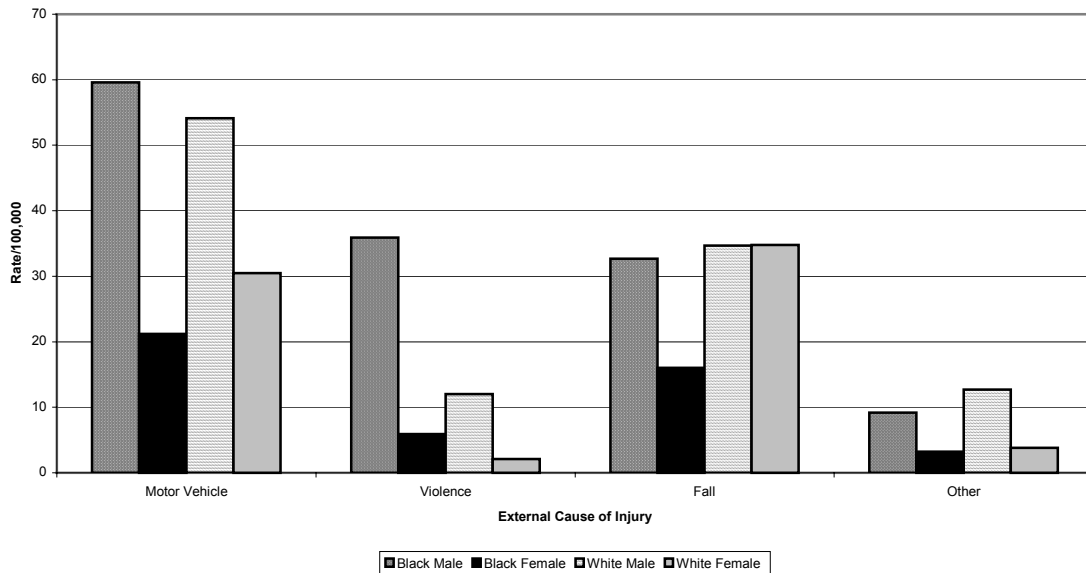


The estimated age-specific incidence rates from 1996 to 1999 for motor vehicle crashes were highest among the 15-24 year age group. Incidence rates were significantly higher for those 75 years of age or older for fall-related traumatic brain injuries as compared to all other causes.

*Related Figure, page 17*

Figure 8

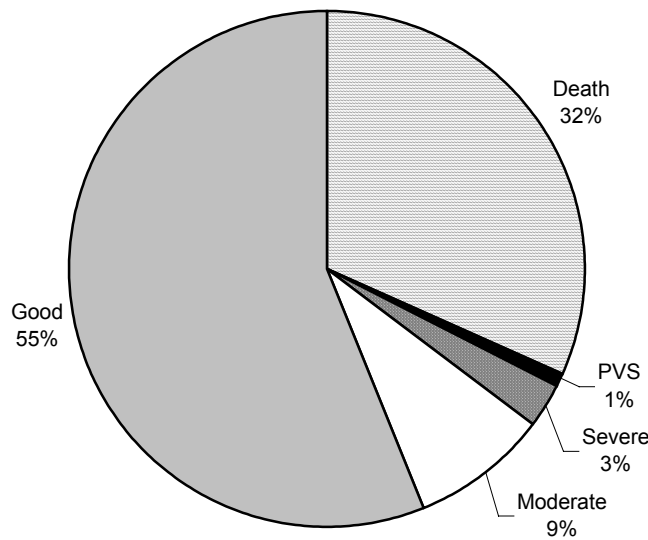
**Estimated TBI Incidence Rates by Cause of Injury, Race, and Gender,  
LA 1996-1999  
(N=15,576)**



Overall, TBI incidence rates were higher among males than females for all external causes of injury except falls. Black males had the highest rate of motor vehicle (59.6 per 100,000) and violence-related TBI (35.9 per 100,000). White males and white females had the highest rates of fall-related TBI (34.7 per 100,000 and 34.8 per 100,000, respectively).

Figure 9

**Estimated Outcome of Traumatic Brain Injuries, LA 1996-1999**  
(N=16,203)



The majority of persons suffering a TBI had a good recovery. However, 45% of traumatic brain injuries resulted in either death or disability.

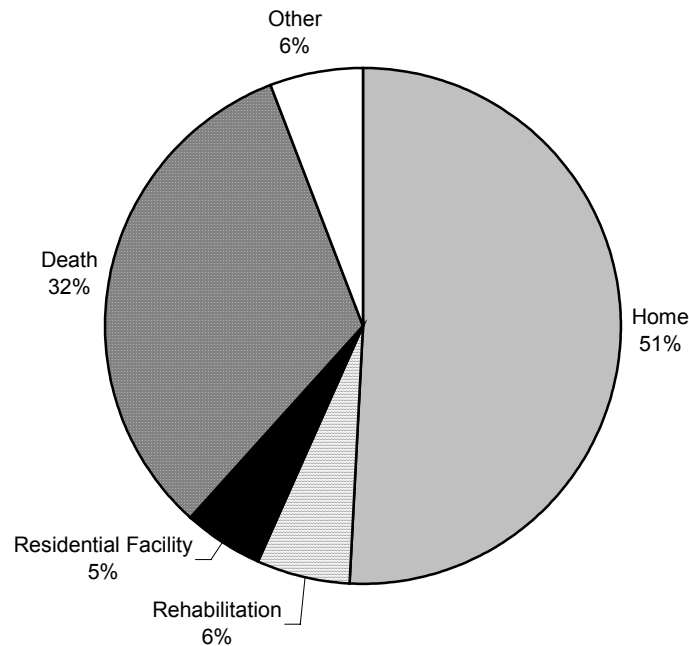
- **Good** recovery refers to those who are independent although the person may have some minor deficits that do not prevent resumption of life activities. This category does not imply return to pre-injury levels.
- **Moderate** disability refers to those who are disabled after the injury but independent with respect to daily life.
- **Severe** disability refers to those who are disabled and dependent with respect to daily life, but are conscious and responsive.
- **PVS** refers to those in a persistent vegetative state.

NOTE: All categories except death are estimated based on 3,308 sampled cases discharged from the acute care facility alive. There were 5,131 total deaths occurring as a result of traumatic brain injury to Louisiana residents from 1996 to 1999.



Figure 10

**Discharge Disposition Following TBI, LA 1996-1999**  
(N=15,887)

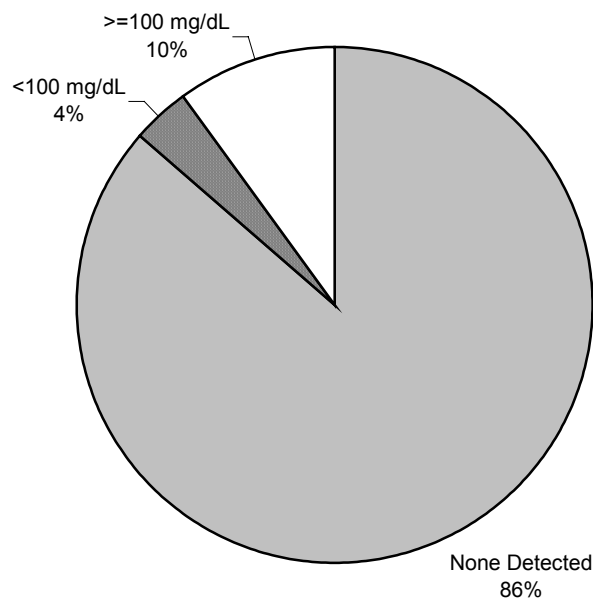


For those for which discharge disposition was known, the discharge disposition of TBI was classified into five categories: *death*, *residential facilities* (both skilled and non-skilled care facilities), *home* (including those requiring non-skilled home health care), *rehabilitation* (which includes home requiring skilled care and use of rehabilitation providers), and *other*.

One-third of those with a TBI from 1996 to 1999 died. Another 11% required either rehabilitation or long-term care. One half of those suffering a TBI were discharged to home.

Figure 11

**Alcohol Involvement in Traumatic Brain Injuries, LA 1996-1999  
(N=3,326)**



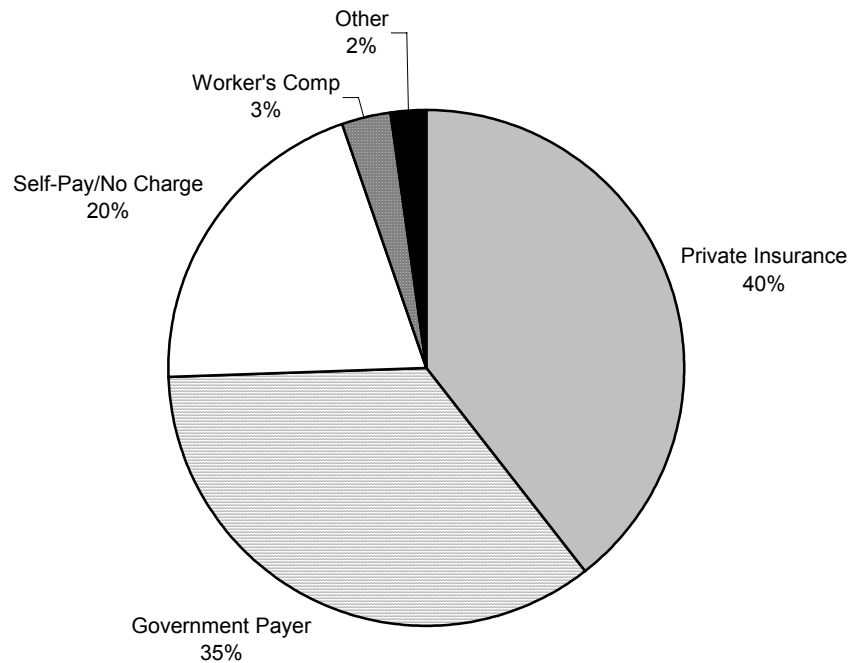
For those in which alcohol use was known, the majority (86%) of those with a traumatic brain injury were not detected to have alcohol involved with the injury. This includes both those who tested negative as well as those who were not tested because alcohol was not suspected.

Four hundred fifty-five persons (14%) tested positive for alcohol use. Of those testing positive for alcohol use, the majority (74%, n=335) were over the Louisiana legal limit for intoxication levels. (At the time of these injuries the Louisiana legal limit was 100 mg/dL or .10%. The legal limit will be lowered to .08% in September 2003.)

NOTE: An additional 127 persons not included in the chart above had clinical evidence of alcohol involvement. This means that the clinical records indicated alcohol was involved, however no lab values for blood alcohol concentration were noted. These persons were left out of the chart because it was not possible to determine whether the individual was above the Louisiana legal limit.

Figure 12

**Method of Payment for TBI, LA 1996-1999**  
(N=3,342)



For those in which the payer was known, payment sources were grouped into five categories: *private insurance* (i.e. private insurance, HMO, self-insured employer plan, and other liability insurance), *government payers* (i.e. Medicare, Medicaid, CHAMPUS and CHAMP-VA), *worker's compensation*, *self-pay/no charge*, and *other*.

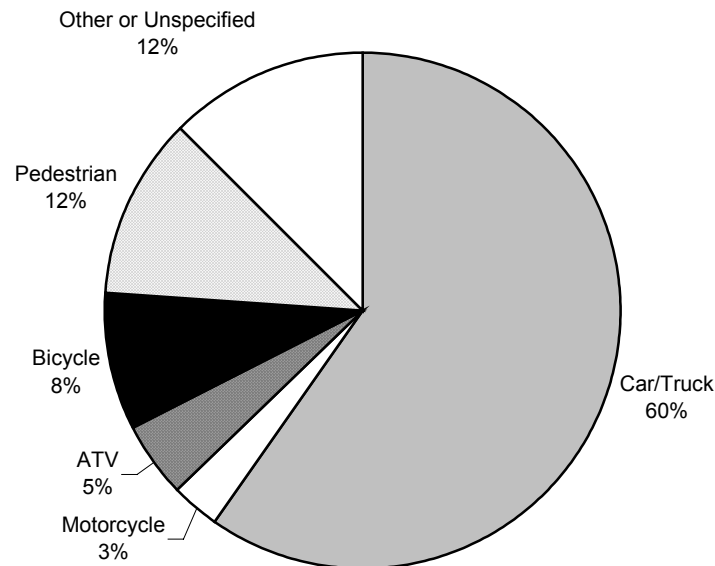
The costs for three-quarters of TBI were paid by either private insurance or government payers. One-fifth of the injuries were classified as either self-pay or no charge.

## HIGHLIGHTS: Selected Traumatic Brain Injuries (Figures 13-16)

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Figure 13

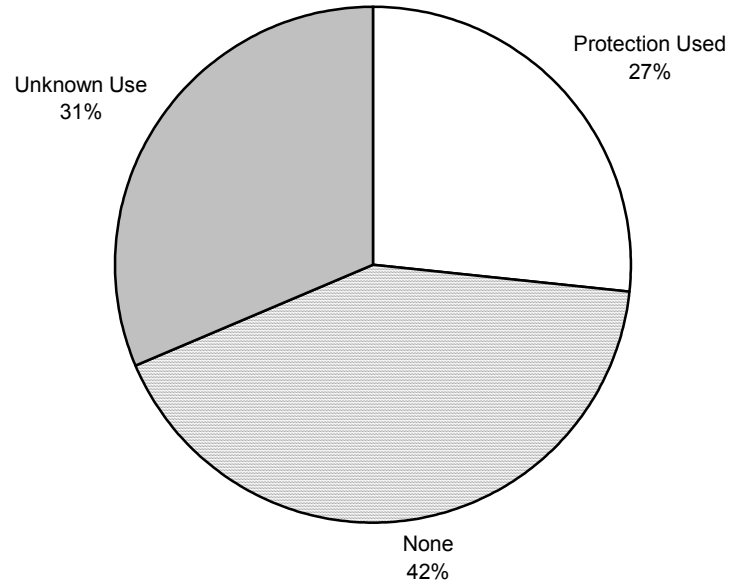
### Motor Vehicle Crash-Related TBI by Vehicle Type, LA 1996-1999 (N=1,616)



There were 1,616 motor vehicle crashes resulting in TBI from 1996 to 1999. Almost two-thirds (60%) of these crashes were to the driver or passenger of a car or truck. Sixteen percent of TBI were to drivers or passengers of other types of vehicles (i.e. motorcycles, all-terrain vehicles, or bicycles). Pedestrians struck by vehicles accounted for 12% of TBI.

Figure 14

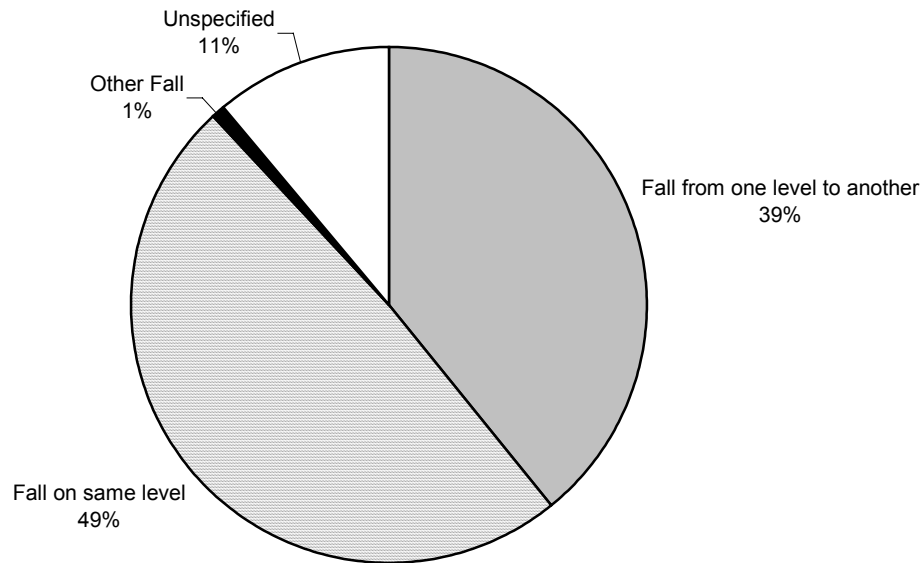
**Protective Equipment Use in Transport-Related Crashes Leading to TBI,  
LA 1996-1999  
(N=1,616)**



Only one-quarter (27%) of those sustaining a TBI as a result of a vehicle were known to be using personal protective equipment at the time of the injury. Person protective equipment includes use of seat belts and helmets.

Figure 15

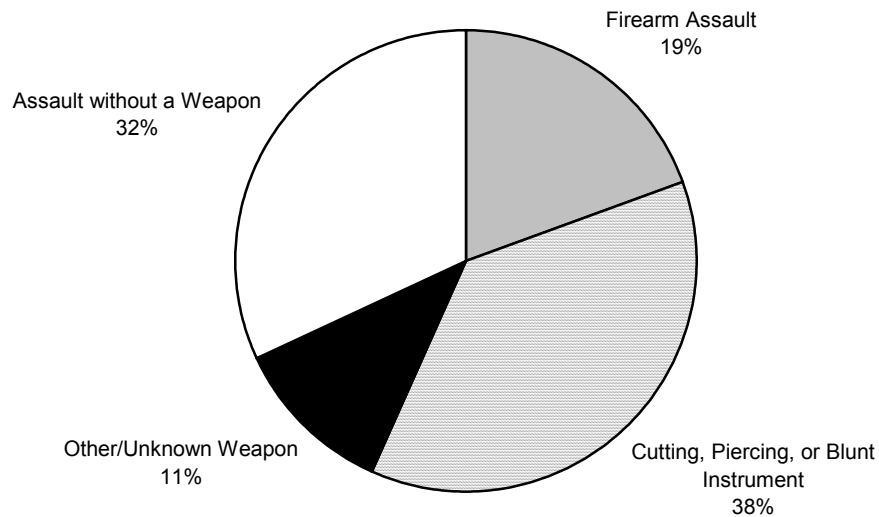
**Fall-Related TBI by Fall Type, LA 1996-1999**  
(N=1,227)



Of those persons sustaining a fall-related traumatic brain injury, over one-third (39%) fell from one level to another (i.e. fall from furniture or fall on stairs). Almost one-half (49%) fell on the same level (i.e. fall while walking on a flat surface).

Figure 16

**Violence-Related TBI by Weapon Type, LA 1996-1999**  
(N=447)



The majority (68%) of all violence-related traumatic brain injuries to Louisiana residents from 1996 to 1999 involved the use of a weapon. In over one-third (38%) of TBI a cutting, piercing, or blunt instrument was the weapon used. Almost one-third of violence-related TBI were physical assaults without any additional weapon use.

# Spinal Cord Injury

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## Summary

The estimated national average rate of spinal cord injury is 4.0 per 100,000 U.S. residents.<sup>7</sup>

From January 1, 1996 to December 31, 1999, 1,089 Louisiana residents sustained a spinal cord injury. This resulted in an overall SCI incidence rate of 6.2 per 100,000 Louisiana residents, which is higher than the national rate. Males were 3.2 times more likely to experience a spinal cord injury than females. Rates of spinal cord injury were highest among persons aged 15 to 44 and among the elderly (Figure 18).

Motor vehicle crashes were the leading cause of spinal cord injury, followed by falls and violence-related injuries (Figure 22). The highest incidence rates, for all causes of injury, were falls among those 75 years and older. The incidence rate for motor vehicle crash-related SCI was highest among persons aged 15 to 24 years (Figure 23).

In over two-thirds of motor vehicle crash-related SCI the injured person was the occupant of a car or truck (Figure 29). One-half of fall-related SCI were the result of a fall from one level to another (Figure 31). Over three-quarters of violence-related SCI involved a firearm (Figure 32).

Almost one half (44%) of those persons sustaining a SCI were discharged with a diagnosis of complete spinal cord injury or incomplete, non-functional spinal cord injury. Thirty-seven percent were classified as having an incomplete, functional spinal cord injury while 21% regained normal function (Figure 25).

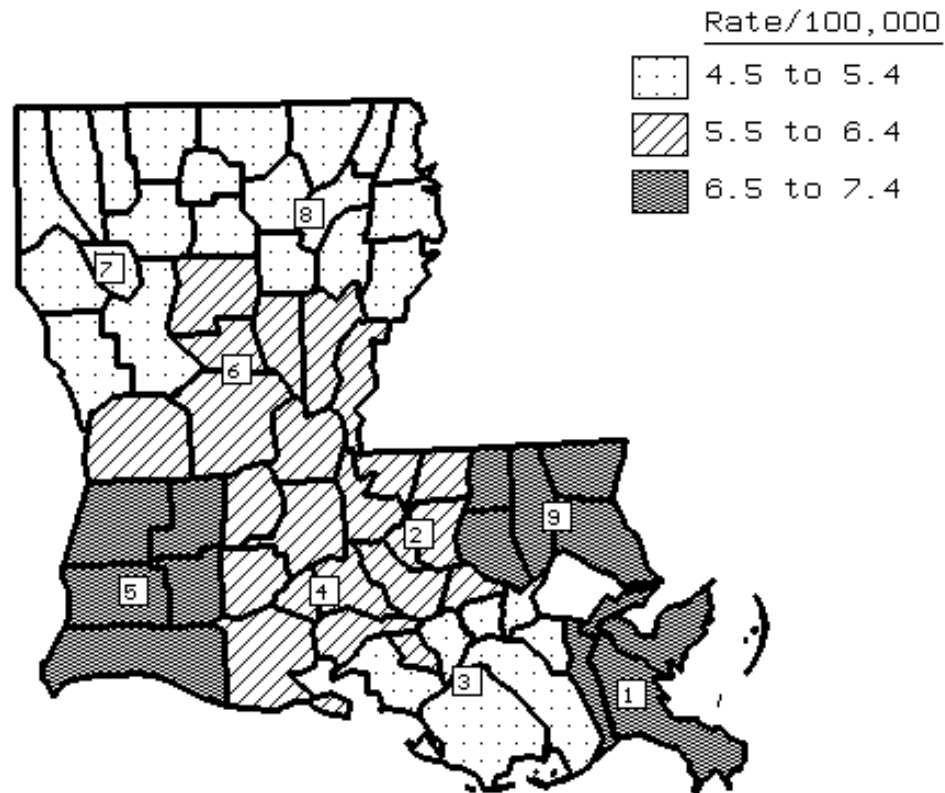
Thirty-four percent of all persons sustaining a SCI in Louisiana between 1996 and 1998 required rehabilitation or long-term care in a residential facility as a result of their injury. Almost one in five (18%) died and 35% were discharged to home (Figure 26).

The following charts and commentary on pages 20-36 provide a more in-depth report on SCI in Louisiana during 1996-1999.



Figure 17

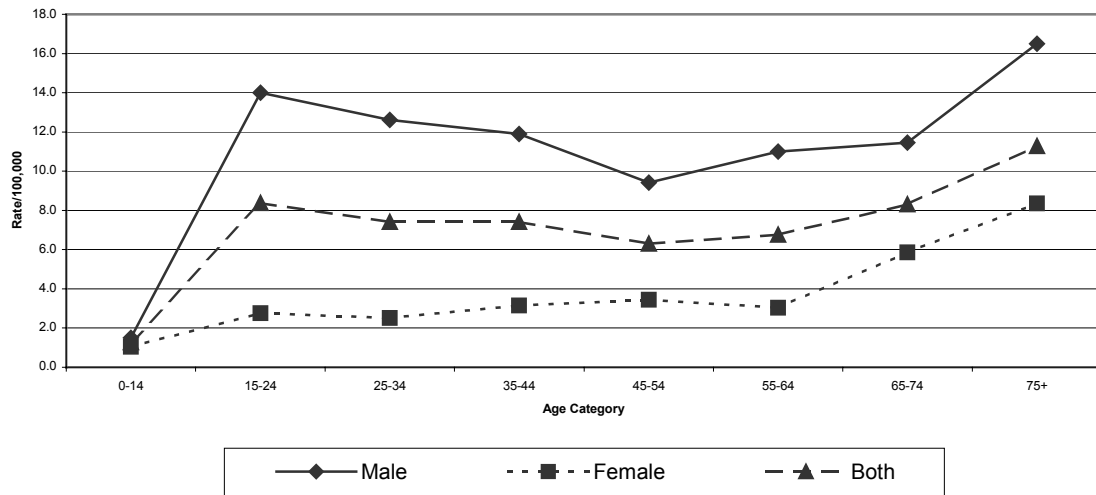
**Mean Annual SCI Incidence Rates by Region of Residence, LA 1996-1999**  
(N=1,076)



The average annual SCI incidence rate for Louisiana between 1996 and 1999 was 6.2 per 100,000. The highest incidence rate of SCI was 7.5 per 100,000 in Region 1 (Jefferson, Orleans, Plaquemines, and St. Bernard Parishes), followed by 7.0 per 100,000 in Region 9 (Livingston, St. Helena, St. Tammany, Tangipahoa, and Washington Parishes). The lowest incidence rate of SCI was 4.9 per 100,000 in Region 8 (Caldwell, E. Carroll, Franklin, Jackson, Lincoln, Madison, Morehouse, Ouachita, Richland, Tensas, Union, and W. Carroll Parishes).

Figure 18

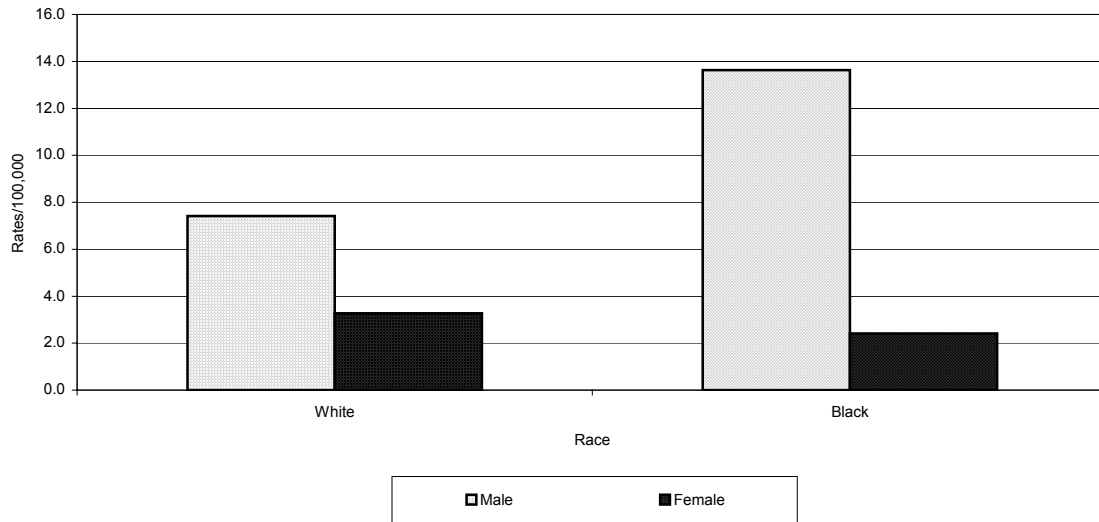
**Mean Annual Incidence Rate of SCI by Age Category, LA 1996-1999  
(N=1,089)**



This figure shows the average incidence rates of SCI by age category and gender. The rates are highest among persons 15-24 years of age and among the elderly. Rates for males are higher in all age groups with the exception of those among the very young, which were the same for males and females.

Figure 19

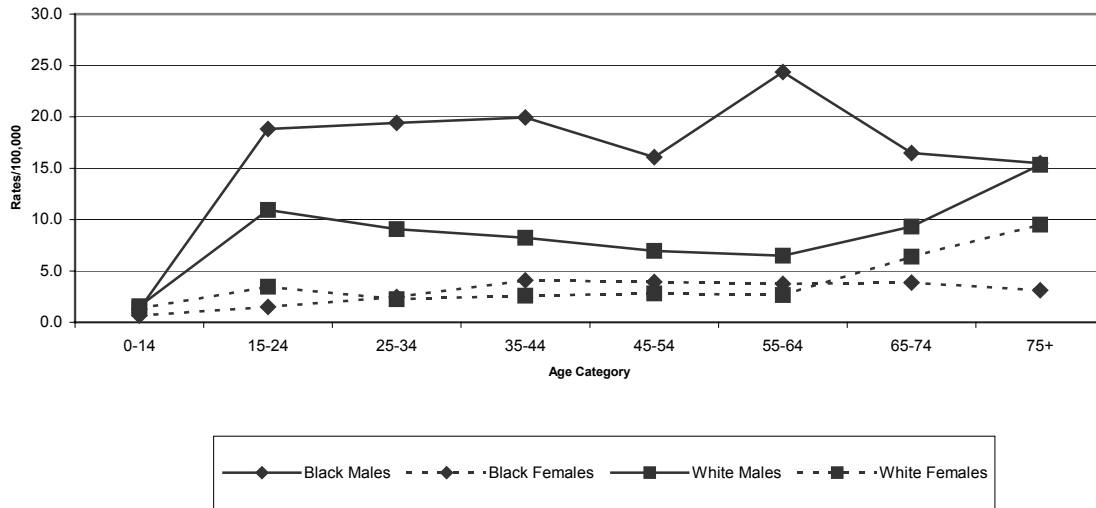
**Mean Annual SCI Incidence Rates by Race and Gender, LA 1996-1999  
(N=1,039)**



Males consistently have higher incidence rates. The rate for black males (13.6 per 100,000) was nearly two times the rate for white males (7.4 per 100,000). Black females (2.4 per 100,000) and white females (3.3 per 100,000) had similar rates of SCI.

Figure 20

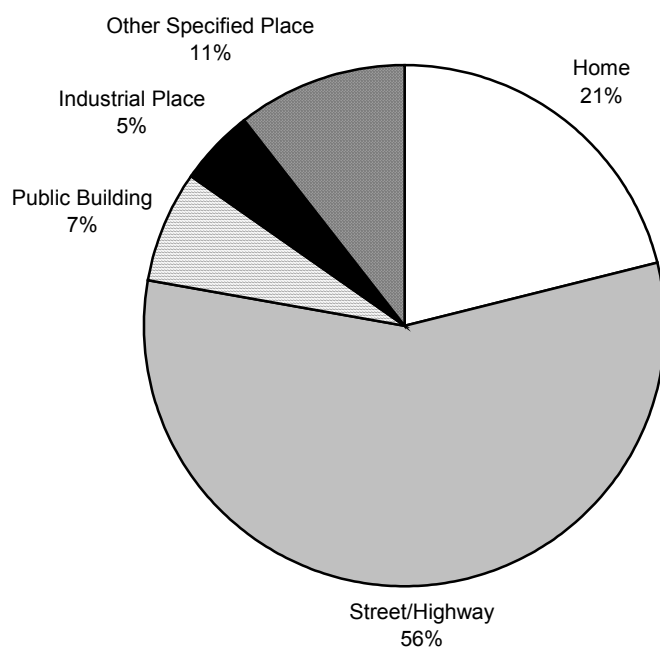
**SCI Incidence Rates by Age Category, Race, and Gender, LA 1996-1999  
(N=1,039)**



This figure shows SCI incidence rates by age category as well as race and gender. The incidence of SCI is consistently highest for black males among all age groups.

Figure 21

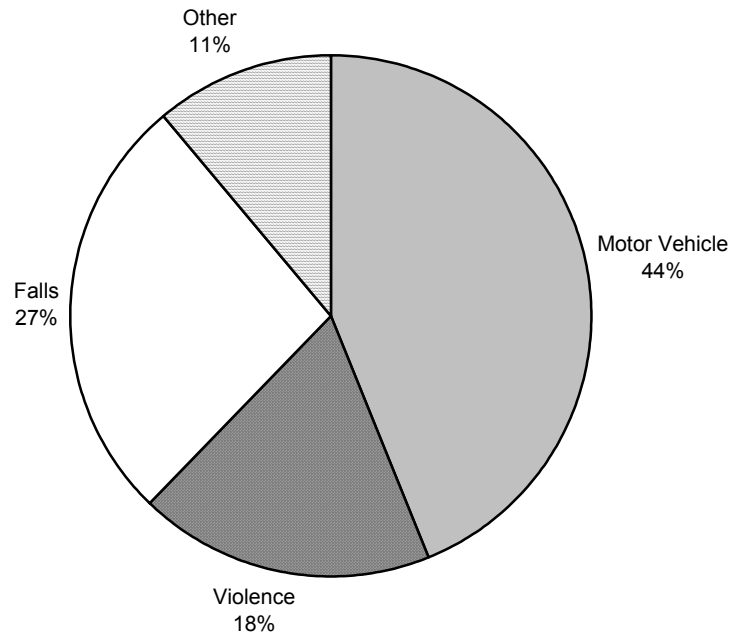
**Place of Occurrence of Spinal Cord Injuries, LA 1996-1999  
(N=532)**



For those in which place of injury is known, the majority (56%) of all the SCI occurred on a public street or highway. An additional 21% occurred in a home (which includes residential facilities such as nursing homes). Thirteen percent occurred in a public building (e.g. restaurants, night clubs, hotels, or churches) or at an industrial location.

Figure 22

**External Cause of Spinal Cord Injury, LA 1996-1999  
(N=527)**

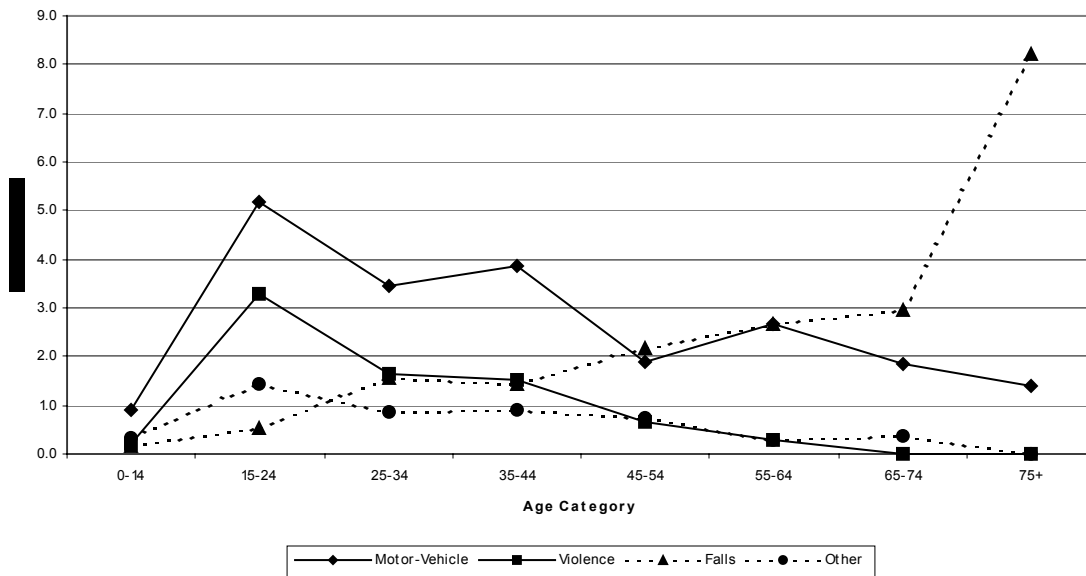


Between 1996 and 1999, motor vehicle crashes (including pedestrian-related crashes) were the leading known cause of spinal cord injury in Louisiana (44%), followed by falls (27%). Violence (which includes violence-related injuries with and without weapons) accounted for almost 20% of all SCI in Louisiana.

*Related Figures, pages 32-35*

Figure 23

**Estimated SCI Incidence Rates by Age and Cause of Injury, LA 1996-1999  
(N=1,089)**

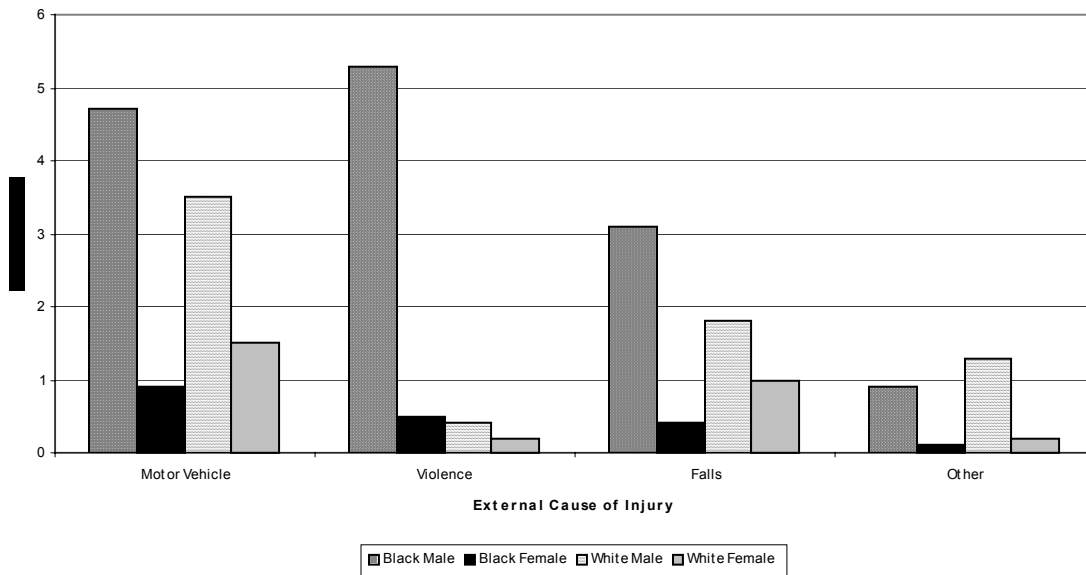


The estimated age-specific incidence rates from 1996 to 1999 for motor vehicle crashes and violence were highest among the 15-24 year age group. The estimated incidence rate for falls generally increased over time.

*Related Figure, page 34*

Figure 24

**Estimated SCI Incidence Rates by Cause of Injury, Race, and Gender,  
LA 1996-1999  
(N=1,039)**

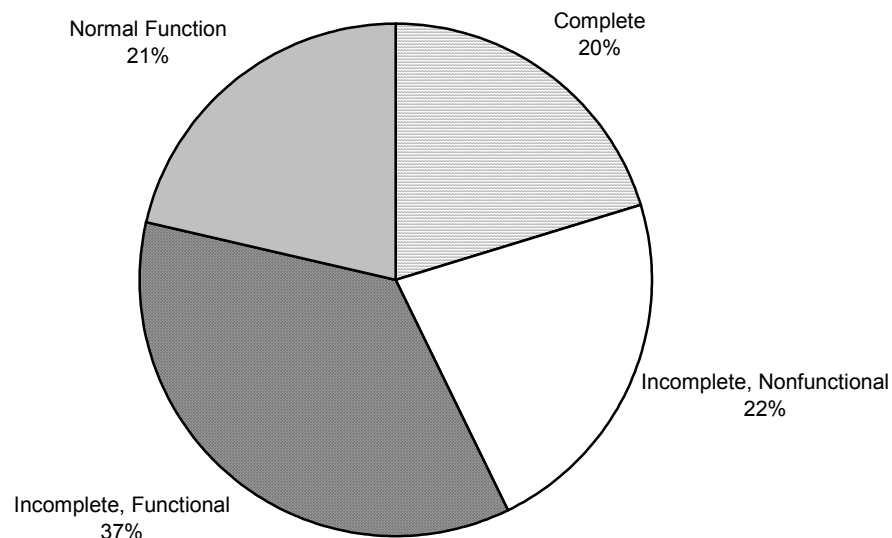


Overall, motor-vehicle crash incidence rates were higher among males than females for all external causes of injury except violence. Black males had the highest rate of motor vehicle (4.0 per 100,000), violence (5.2 per 100,000) and fall-related SCI (3.0 per 100,000).



Figure 25

**Functional Extent of Spinal Cord Injuries, LA 1996-1999  
(N=476)**

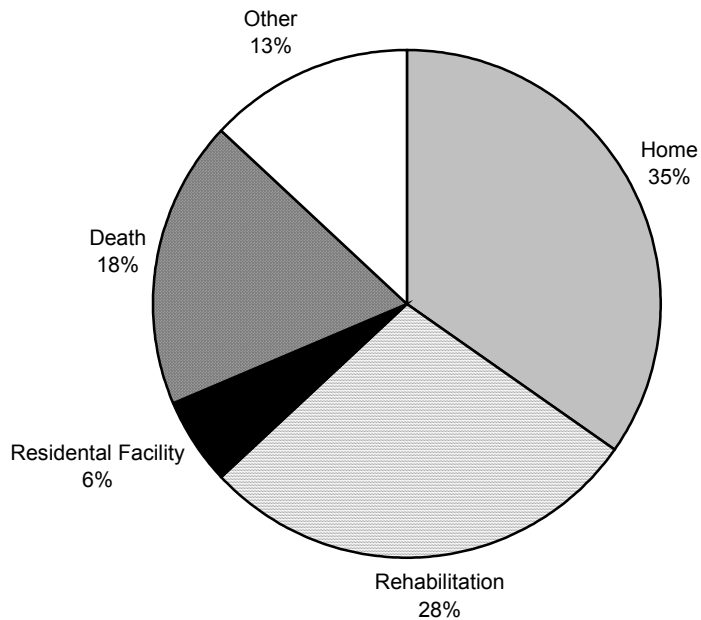


One out of five spinal cord injuries were complete cord transections, while 22% were incomplete injuries in which the patient was rendered nonfunctional. Another 37% were incomplete injuries in which the patient was rendered functional, and 21% regained normal function.

- **Complete** refers to those injuries in which the person regains no motor or sensory function.
- **Incomplete-nonfunctional** refers to persons who have some amount of sensory or motor function however there is no real preservation of motor function.
- **Incomplete functional** refers to an injury in which the person has functionally useful voluntary motor activity.
- **Normal** refers to a full return of all motor, sensory, and autonomic functions.

Figure 26

**Discharge Disposition Following SCI, LA 1996-1999**  
(N=1,060)

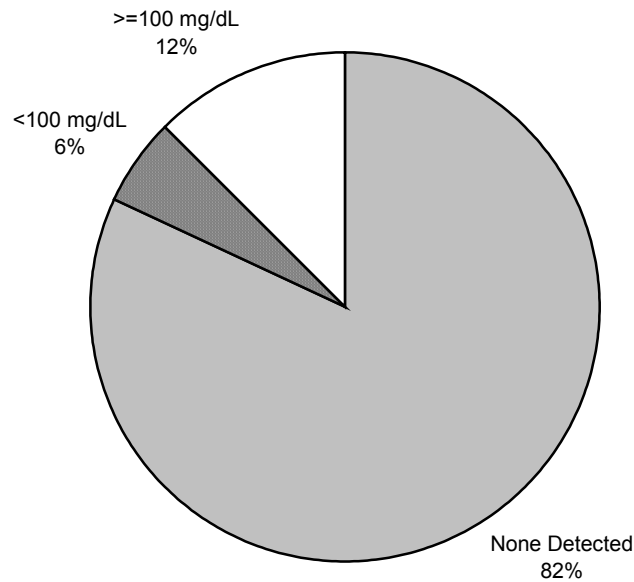


For those for which discharge disposition was known, the discharge disposition of SCI was classified into five categories: *death*, *residential facilities* (both skilled and non-skilled care facilities), *home* (including those requiring non-skilled home healthcare), *rehabilitation* (which includes home requiring skilled care and use of rehabilitation providers), and *other*.

One-third (34%) of SCI required either rehabilitation or long-term care in a residential facility. Another one-third were discharged to home. Of those suffering a spinal cord injury, about one in five (18%) died.

Figure 27

**Alcohol Involvement in Spinal Cord Injuries, LA 1996-1999  
(N=459)**

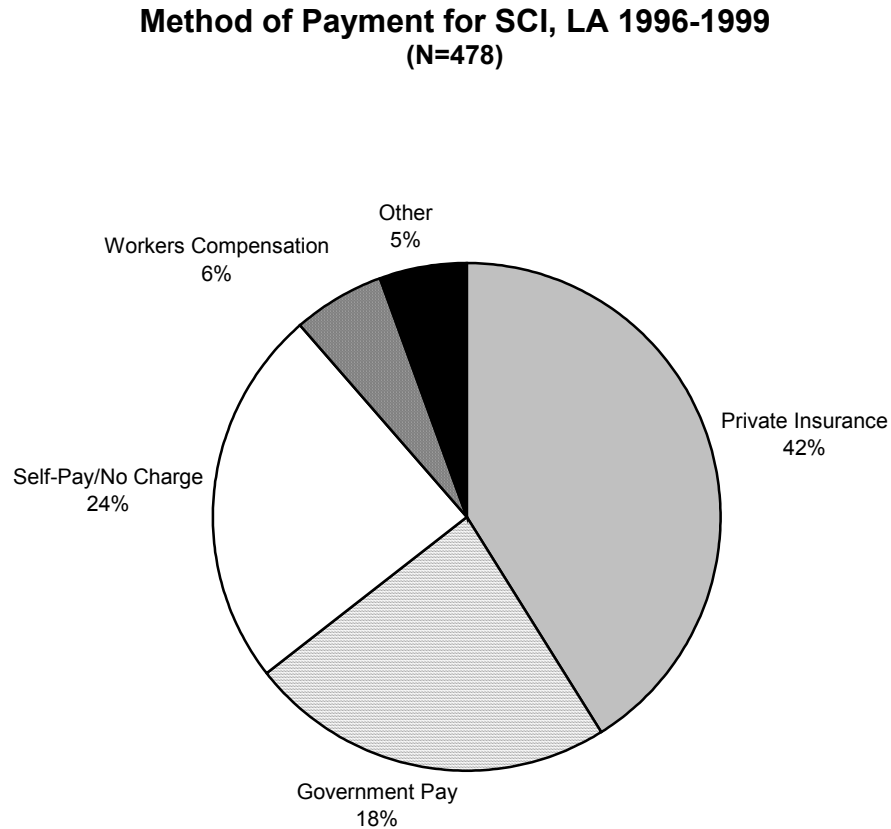


For those in which alcohol use was known, the majority (82%) of those with a spinal cord injury were not detected to have alcohol involved with the injury. This includes both those who tested negative as well as those who were not tested because alcohol was not suspected.

Eighty-three persons (18%) tested positive for alcohol use. Of those testing positive for alcohol use, the majority (69%, n=57) were over the Louisiana legal limit for intoxication levels. (At the time of these injuries the Louisiana legal limit was 100 mg/dL or .10%. The legal limit will be lowered to .08% in September 2003.)

NOTE: An additional 22 persons not included in the chart above had clinical evidence of alcohol involvement. This means that the clinical records indicated alcohol was involved, however no lab values for blood alcohol concentration were noted. These persons were left out of the chart because it was not possible to determine whether the individual was above the Louisiana legal limit.

Figure 28



For those in which the payer was known, payment sources were grouped into five categories: *private insurance* (i.e. private insurance, HMO, self-insured employer plan, and other liability insurance), *government payers* (i.e. Medicare, Medicaid, CHAMPUS, and CHAMP-VA), *worker's compensation*, *self-pay/no charge*, and *other*.

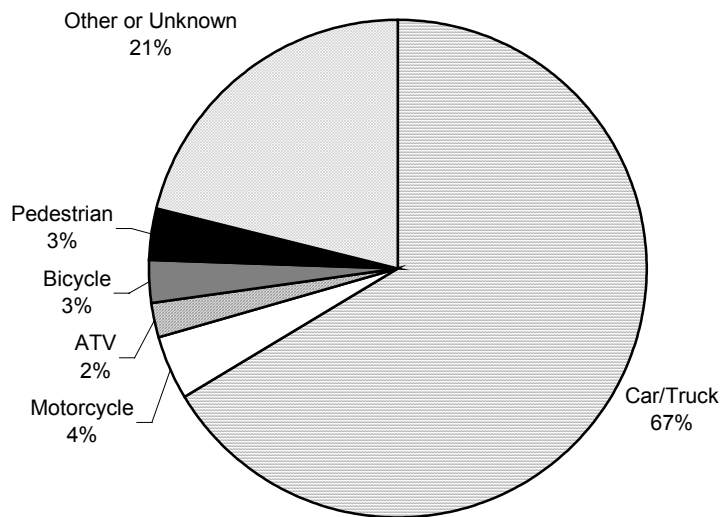
The costs for almost two-thirds (60%) of TBI were paid by either private insurance or government payers. One-quarter (24%) of the injuries were classified as either self-pay or no charge.

## HIGHLIGHTS: Selected Spinal Cord Injuries (Figures 29-32)

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Figure 29

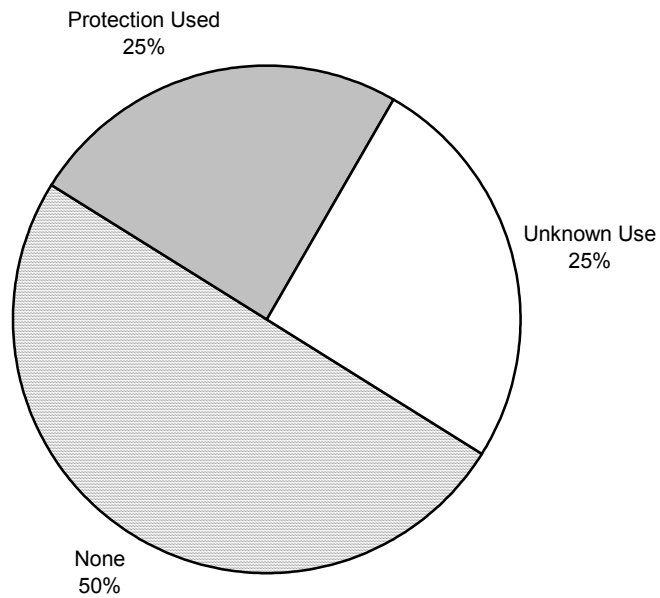
### Motor Vehicle Crash-Related SCI by Vehicle Type, LA 1996-1999 (N=232)



There were 232 motor vehicle crashes resulting in SCI from 1996 to 1999. Two-thirds of these crashes were to the driver or passenger of a car or truck. Nine percent of TBI were to drivers or passengers of other types of vehicles (i.e. motorcycles, all-terrain vehicles, or bicycles). Pedestrians struck by vehicles accounted for 3% of TBI.

Figure 30

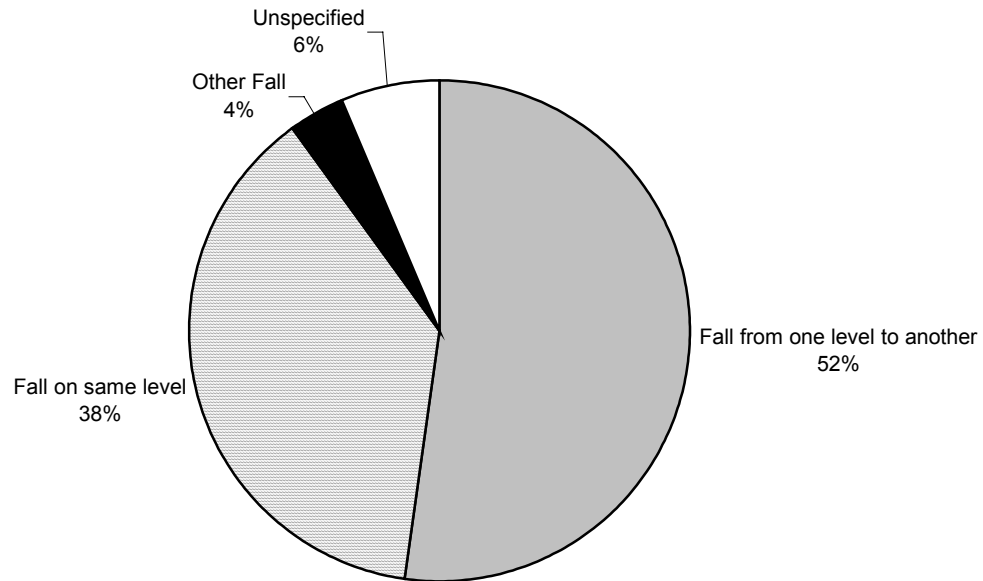
**Protective Equipment Use in Transport-Related Crashes Leading to SCI,  
LA 1996-1999  
(N=224)**



One quarter of those sustaining spinal cord injury as a result of transport-related injury reported using protective equipment such as a seat belt or helmet.

Figure 31

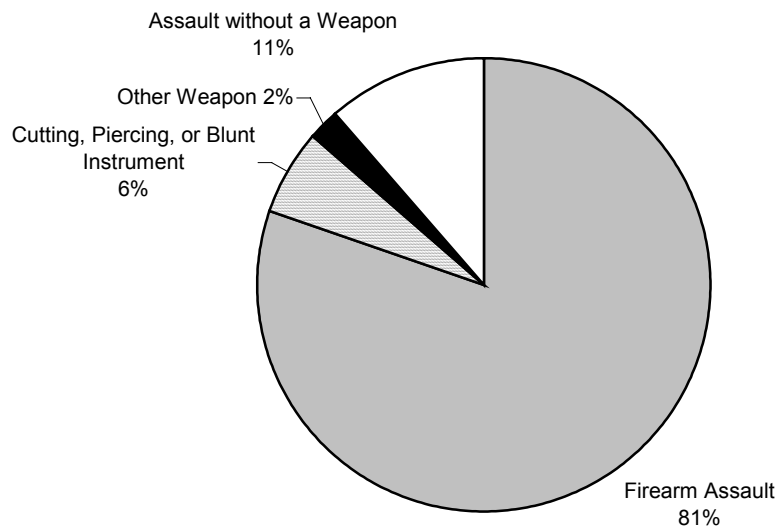
**Fall-Related SCI by Fall Type, LA 1996-1999  
(N=140)**



Of those persons sustaining a fall-related spinal cord injury, over one-half (52%) fell from one level to another (i.e. fall from furniture or fall on stairs). An additional 38% fell on the same level (i.e. fall while walking on a flat surface).

Figure 32

**Violence-Related SCI by Weapon Type, LA 1996-1999  
(N=96)**



Violence accounted for 16% of all spinal cord injuries to Louisiana residents from 1996 to 1999. The majority (81%) of violence-related SCI were the result of an assault with a firearm. Assaults without any weapons accounted for 11% of violence-related SCI.



# Appendix

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## Case Definition

The following case definitions are those recommended by the Centers for Disease Control and Prevention.

### ***Traumatic Brain Injury***

A case of traumatic brain injury (TBI) is defined as either an occurrence of injury to the head that is documented in a medical record with one or more of the following conditions attributed to head injury:

- observed or self-reported decreased level of consciousness
- amnesia
- skull fracture
- objective neurological or neuropsychological abnormality
- diagnosed intracranial lesion
- occurrence of death resulting from trauma, with head injury listed on the death certificate, autopsy report, or medical examiner's report in the sequence of conditions that resulted in death<sup>4</sup>

### ***Spinal Cord Injury***

A case of spinal cord injury is defined as the occurrence of an acute traumatic lesion of neural elements in the spinal canal (spinal cord and cauda equina), resulting in any degree of sensory deficit, motor deficit, or bowel or bladder dysfunction, either temporary or permanent.

The clinical definition of spinal cord injury excludes the following:

- intervertebral disc disease
- vertebral injuries in the absence of spinal cord injury
- nerve root avulsions and injuries to nerve roots and peripheral nerves outside the spinal canal
- birth trauma
- cancer, spinal cord vascular disease, and other nontraumatic spinal cord diseases<sup>4</sup>

## Methods

The Louisiana TBI-SCI surveillance system has two components: hospital data and mortality data.

### ***Hospital Data***

There are 149 hospitals in Louisiana currently licensed by the Department of Health and Hospitals. Currently, data is requested from 118 of these hospitals. Hospitals that were excluded from this request included facilities that specialized in rehabilitation only, psychiatric care only, labor and delivery only or some other specialty. We requested a printout from each hospital based on ICD-9-CM codes<sup>8</sup> and date of discharge. Each hospital submitted a printout of all persons who were admitted to the hospital and discharged between January 1, 1996 and December 31, 1999 who had at least one diagnostic code for a traumatic brain or spinal cord injury. The printouts contained the following variables:

- |                        |                                  |
|------------------------|----------------------------------|
| -name                  | -race                            |
| -medical record number | -date of birth                   |
| -date of admission     | -discharge disposition           |
| -date of discharge     | -zip code                        |
| -gender                | -all ICD-9-CM codes <sup>8</sup> |

This data was entered into a computer database and a random sample of TBI was selected. Office of Public Health personnel then traveled to the various hospitals to abstract additional data from sampled TBI cases and all SCI cases. The following additional variables were obtained from hospital records:

- |   |                               |
|---|-------------------------------|
| -social security number                               | -address                      |
| -method of payment                                    | -cause of injury              |
| -place of injury                                      | -parish of injury             |
| -work relatedness of injury                           | -intentionality               |
| -motor vehicle position (if applicable)               | -drug and alcohol involvement |
| -use of personal protective equipment (if applicable) | -presence of skull fracture   |
| -level of consciousness                               | -presence of amnesia          |
| -presence of intracranial lesion                      |                               |
| -level and extent of spinal cord injury               |                               |

### ***Mortality Data***

Louisiana maintains a file of all deaths of state residents. These data include information concerning residence, gender, race, date of birth, date of death, place of injury, and ICD-9 codes<sup>8</sup> for the nature and external cause of injury, and personal identifiers. To capture pre-hospitalization deaths, these data were queried for persons who died as a result of a TBI or SCI from 1996 to 1999. Those persons were matched with persons identified through the hospital data and only entered once.

# References

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